The JOURNAL *of* GEOGRAPHY

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VOLUME XXXII MAY, 1933 NUMBER 5

JAPAN AND THE MANCHURIAN IRON INDUSTRY

JOHN R. STEWART
Columbia University

There is a school of thought among foreign observers of Japanese activities in Manchuria which interprets Japanese aims in that disputed region as fundamentally economic. This view is based upon two general assumptions: (1) that the industrial development of Japan, upon which that nation must mainly rely for the solution of its pressing population problems, is greatly handicapped by its natural poverty in basic raw materials, minerals, and fuels; (2) that Manchuria possesses an abundant supply of these needed materials of modern industry in the form of its extensive coal, iron, forest, and agricultural resources.

From these assumptions it is possible to argue a vital relationship between Manchuria's resources and Japan's economic structure. The urgent need of expansion, it can be contended, gives a moral justification to the acquisition of control over those resources. Present military operations, it can be further explained, are essentially intended to obtain a wider measure of political security for the many Japanese railway, mining and industrial enterprises thru the establishment of a more direct supervision over the Chinese administrations of the Northeastern provinces.

This school of thought emphasizes the extent of Japanese economic interests in Manchuria. Direct and indirect investments in railway, commercial and industrial undertakings and in loans to Chinese public and private agencies are shown to exceed one billion dollars. The region is called vital to Japan's economic life in at least three respects: as a source of foodstuffs and fertilizers, as a supplier of industrial raw materials and minerals, and as a profitable market for Japanese goods.

Of particular interest, however, is the thesis which finds typical expression in the following statement: "Manchuria is rich in resources, especially in the primary raw materials needed by the

Japanese steel industry." From this may be drawn the conclusion that "the need of basic materials for iron and steel production is the paramount reason for Japan's evident desire to obtain complete political control over southern Manchuria." Similar state-

FIG. 1. Sketch map of Manchuria.

ments of Manchuria's wealth in iron ore resources are so frequently made in Japanese and foreign sources that they should not be allowed to pass unquestioned. The purpose of this article is to assess the value of Manchuria's iron resources in relation to Japan's desire to free its iron and steel industry from dependence upon foreign sources of supply.

THE DEPENDENT POSITION OF JAPAN'S IRON INDUSTRY

Japan's dependence upon foreign iron supplies is easily shown. Total reserves of iron ore commercially utilizable under existing

mining and metallurgical processes are estimated at 40,960,000 tons in Japan proper, and there are another 40,000,000 tons of ore which may possibly prove to be utilizable. Japan's total iron ore reserves would thus be barely adequate to provide a two years' supply for the normal requirements of the American iron and steel industry. These figures, however, do not include the enormous deposits of iron sands at Kuji in northwestern Honshu; but the exploitation of these deposits is still in an experimental stage, so that their value as a future supply of iron cannot be assessed. Further reserves of between 10,000,000 and 40,000,000 tons of ore exist in Korea; while some ore deposits are also to be found in Formosa.

The production of iron ore from mines in Japan proper is of negligible importance to the Japanese iron and steel industry. Between 1920 and 1928 home output fell from 314,858 tons to 157,706 tons. At the same time the proportion of domestic ore to the total supply of ore available for Japanese blast furnaces declined from 24 to 8 per cent. During recent years, therefore, over 90 per cent of the raw ore smelted in Japan proper has been imported from overseas sources, as follows (in thousands of metric tons):

Year	Domestic Production	Imports				Total Supply
		Korea	China	Straits Settlements	Total	
1920	314.9	332.5	650.5		662.4	1,309.8
1921	87.0	190.5	439.8		578.1	855.6
1922	39.7	89.8	644.8		818.5	948.1
1923	55.2	95.4	661.8	163.4	893.3	1,043.8
1924	57.9	136.7	800.2	264.9	1,065.1	1,259.8
1925	75.8	107.9	813.5	290.2	1,103.7	1,287.3
1926	130.4	99.0	502.7	290.1	792.8	1,022.2
1927	159.0	170.2	506.8	438.5	945.3	1,274.4
1928	157.7	—	—	—	1,842.4	2,000.1

With regard to the supply of pig iron, Japan's position is more favorable. Less than 40 per cent of this supply need be imported, and these imports include substantial shipments from Japanese-controlled iron works in Manchuria. British India, China and the United States are the principal foreign sources of imported pig iron.

Despite these large imports of foreign iron ore and pig iron for use in Japanese blast furnaces and steel works, only 64 per cent of the total supply of finished and semifinished steel products was produced in Japan proper in 1927. In that year 996,996 metric tons of steel products were imported from foreign countries.

THE PIG IRON SUPPLY OF JAPAN PROPER*

Year	Domestic Production	Korean Exports to Japan	Imports	Total Supply	Ratio of Domestic Production to Total Supply
1920	521.0	40.7	348.7	910.4	57.2
1921	472.7	48.1	227.1	747.9	63.2
1922	550.8	80.0	327.9	958.8	57.5
1923	599.7	81.9	346.0	1,027.6	58.4
1924	585.9	73.5	441.9	1,101.4	53.2
1925	685.2	83.9	316.4	1,085.4	63.0
1926	809.6	102.5	399.6	1,311.8	61.6
1927	895.2	100.5	472.9	1,486.7	61.0
1928	1,092.5	144.3	569.2	1,806.1	60.5

* In thousands of metric tons.

It is thus apparent that thruout all the stages of the Japanese iron and steel industry from the supply of raw ore to the output of finished steel products, there is a marked dependence upon foreign sources. To be self-sufficient in iron and steel production Japan would require approximately 2,750,000 tons of ore annually, based on the average for the three years 1924-1926. For the year 1926 the computation is as follows:

	Metric tons
Imports of ore from foreign countries	792,830
Amount needed to replace foreign steel	1,225,760
Amount needed to replace foreign pig iron	332,974
Ore needed for complete independence	2,351,564

Since that time the requirements of the Japanese iron and steel industry have expanded considerably. In 1928, for example, complete independence from foreign supplies would have required the replacement of 1,842,363 tons of imported ore, 712,734 tons of foreign pig iron, and 770,000 tons of foreign rolled steel. In that year, furthermore, only 2.5 per cent of the total consumption of iron and steel in Japan was supplied from ore mined in the islands of Japan proper.

For Japanese self-sufficiency in iron and steel production Manchuria would therefore have to produce more than three million tons of ore annually or their equivalent in pig iron and finished steel products. However, a survey of the iron ore deposits of Manchuria and of the past history and future prospects of its iron industry will reveal that there is no sound basis for the belief that

Japan is capable of achieving iron and steel independence thru the control of Manchuria's iron resources.

LIMITATIONS UPON VALUE OF MANCHURIA'S IRON RESOURCES

In the form of an extended belt of Archean ores traversing South Manchuria from the Korean border to Yinkou, Liaoning Province possesses the bulk of China's iron ore resources. Altho this iron-bearing zone is very narrow, it extends for 200 kilometres

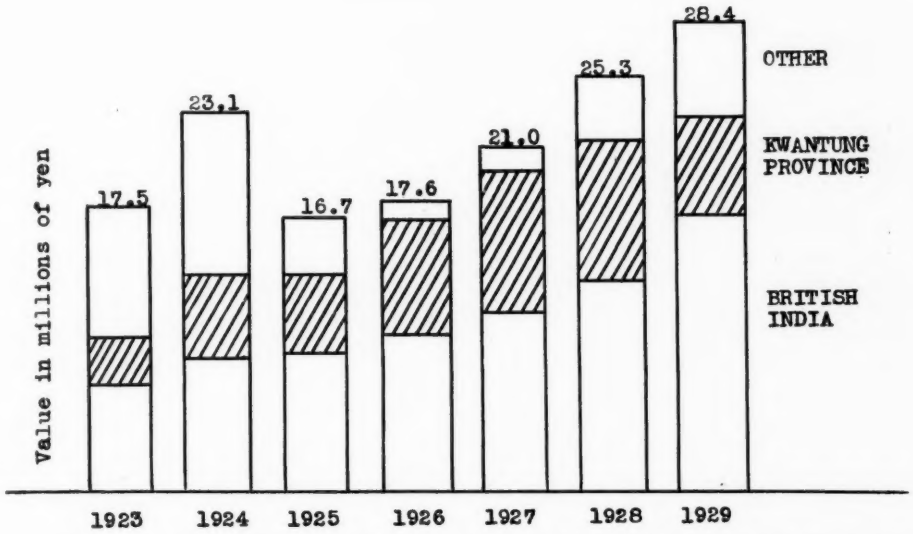


FIG. 2. Japanese imports of pig iron, 1923-27. Manchuria (Kwantung Province) stands out as an important, but not as the leading source, of Japanese imports of pig iron. Source: Financial and Economic Annual of Japan.

across Liaoning Province and contains a large number of individual deposits, some of which have been primitively worked by native methods for many centuries. The important deposits are apparently restricted to three localities: Miao-erh-kou, Kung-chang-ling and Anshan. Their easily available reserves of low and high grade ore have been estimated as follows (in metric tons).

	Low-grade	High-grade	Metallic Iron Content
Miao-erh-kou.....	70,000,000	2,000,000	25,000,000
Kung-chang-ling....	268,000,000	2,300,000	90,000,000
Anshan.....	400,000,000	2,000,000	144,000,000
Total.....	738,000,000	6,300,000	269,000,000

If the large number of scattered deposits are included, it is possible that the Archean ores of Liaoning Province may reach a total of 1,000,000,000 tons of ore of 30-35 per cent grade, containing some 300-350,000,000 tons of actual iron. These resources are the largest in the Far East. They represent over three-quarters of China's estimated reserves of actual and potential ore.

There is no question as to the size and importance of these deposits. Their exploitation, however, is handicapped by the fact that the bulk of the ore is of very low grade. The resources of good

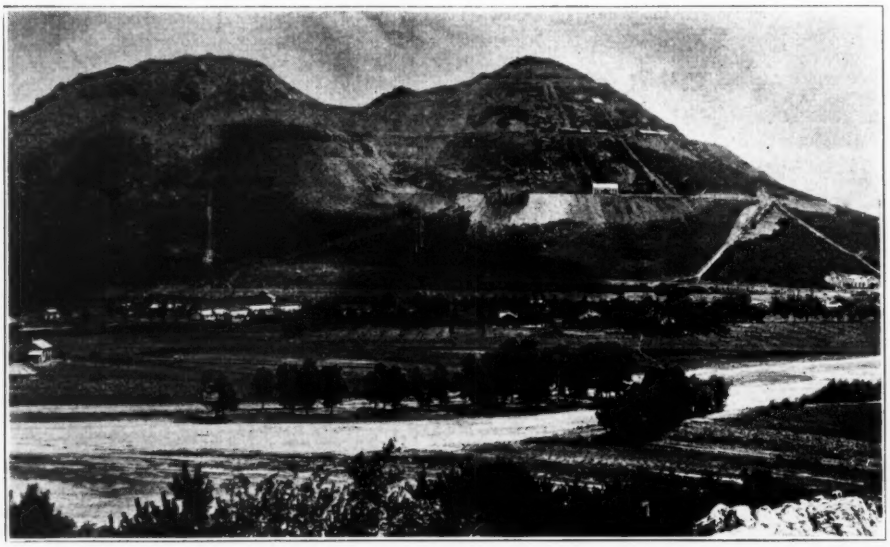


FIG. 3. Takushan iron ore mines at Anshan iron works. Courtesy, South Manchurian Railway Co.

ore of 60-70 per cent grade do not exceed 10,000,000 tons, and in addition are so scattered as to prevent their economical development alone. Most of the ore ranges from 30-35 per cent, with an average iron content of 34.9 per cent. Moreover, its silicon content is so high (45-55 per cent) that pig iron made directly from it is unsatisfactory. When the Anshan Iron Works were first placed in operation, this poor ore was used directly in the blast furnaces; but the pig iron so produced proved to be so unsatisfactory that operations were restricted to the small deposits of secondarily enriched ores, pending the solution of the poor ore problem.

It is this question of utilizing low-grade ores on which depends the entire future of the iron industry in Manchuria. The South Manchurian Railway Company, which operates the Anshan Iron Works, has devoted large sums to the solution of this vital prob-

lem. In 1925 it announced the discovery of a new hematite reducing process which was claimed to be both technically and commercially feasible. In 1926 it completed and placed in operation an ore concentration plant, which permitted the subsequent marked expansion of pig iron production.

The new process is very complicated and involves a long series of operations beginning with the transformation of the ore into hematite, its crushing to a suitable fineness, the separation of impurities, and its final concentration into an artificially rich 55 per

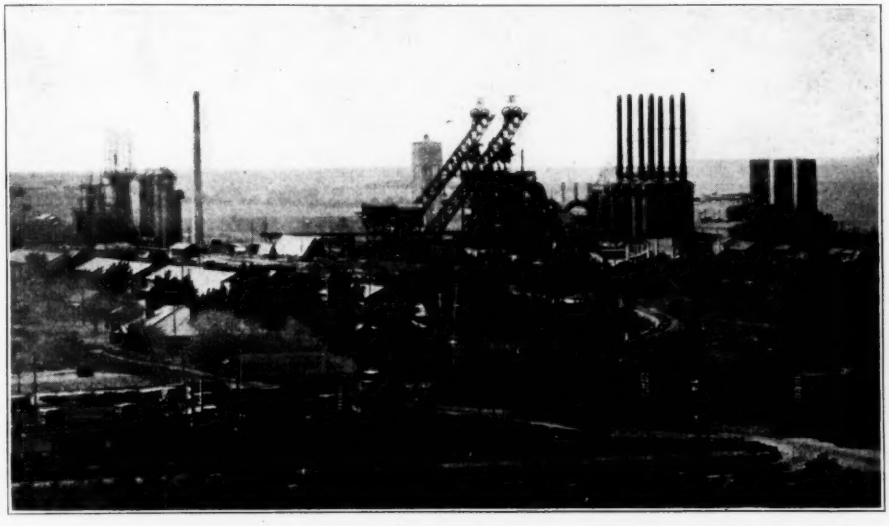


FIG. 4. General view of the Anshan iron works. Courtesy, South Manchurian Railway Co.

cent ore. Nevertheless, it is claimed that the process is economically practicable and can produce pig iron cheaply enough to compete with the output of blast furnaces operating under more favorable conditions. However, it is yet too early to pass upon the commercial feasibility of the new process. There is yet no assurance that the way has been opened to the commercially profitable large-scale exploitation of the extensive deposits of low-grade ore in South Manchuria.

THE RECORD OF UNPROFITABLE OPERATION

The history of the Manchurian iron industry has not been one to inspire confidence in the future prospects of the region as an important source of iron and steel. The record has been one of continuously unprofitable operation. At the present time iron mining and smelting on a modern basis are carried on only at Anshan

and at Penhsihu. The latter is the older, tho less important, enterprise. It was originally a joint Sino-Japanese company, but one of the results of the present crisis has been the elimination of the Chinese interest. The Penhsihu Iron Works exploits the iron ore deposits at Miao-erh-kou and the coal field at Penhsihu. Its equipment consists of two furnaces of 130 tons daily capacity and the annual output varies around 60,000 tons of pig iron. Because of its small output, this plant has never been important.

The outstanding metallurgical enterprise in Manchuria is the Anshan Iron Works of the South Manchurian Railway. The large ore deposits at Anshan were first discovered in 1909 by field workers of the Geological Institute of the Railway Company. The 1915 treaties provided for their exploitation by the Chenhsing Kungssu, a Sino-Japanese company, whose entire output was to be sold to the South Manchuria Railway. Ambitious plans for large-scale metallurgical development, based upon the seeming adequacy of Fushun coal and Anshan iron were thereupon launched, calling for the production of 1,000,000 tons of pig iron, or 800,000 tons of steel, annually. The first blast furnace was completed in December, 1918, the second early in 1920. Actual production of pig iron commenced in May, 1919; but the post-war deflation of iron prices, the many operating difficulties encountered, and the unsuitability of low-grade ore forced the complete reorganization of the Iron Works. Only one furnace was kept in operation, restricted to the limited supply of high-grade ore; while the South Manchuria Railway devoted its efforts to the expensive tasks of solving the poor ore problem and of meeting financial and operating difficulties.

The Anshan Iron Works has been an expensive enterprise. During the first nine years of operation, it lost money continuously. The accumulated deficit over those years amounted to 31.9 million yen. These large losses were due to the restricted scale of operation, caused by the existence of a number of technical difficulties to be overcome. The fundamental problem related to the utilization of low-grade ores. If experience demonstrates that the profitable production of pig iron is possible under the complicated hematite reducing process introduced in 1926, the primary obstacle to Manchurian metallurgical development will have been removed.

In addition to the ore problem, the Anshan Iron Works seems to have been constructed without proper technical preparation and without due regard to the available supply of necessary raw materials, particularly of limestone and coke. Furnace No. 1 had to

be rebuilt after four years of operation to overcome technical difficulties. A further source of expense was the construction of an elaborate water-works to supply the tremendous amount of water required in smelting operations. Moreover, it was originally planned to produce coke from the huge reserves of coal available at nearby Fushun. Unfortunately, Fushun coal, tho excellent for general steam purposes, is not a good coking coal and must therefore be mixed—at a ratio of 80:20—with more suitable coal hauled 85 miles by rail from Penhsihu. Limestone must also be transported by rail from the same locality. Another difficulty lies in the distance from markets. The rail haul to Dairen is some 200 miles, in addition to the sea voyage to Japanese ports. Consequently, heavy transportation costs plus Chinese export and Japanese import duties must be added to manufacturing costs. In short, the Anshan Iron Works is poorly located both as regards accessibility to markets and the assembly of essential raw materials.

These difficulties, however, have been minimized to some extent thru the expansion of production, thru the investment of additional capital, and thru the thoro reorganization of finances. The new concentration plant was completed in 1926; the two original 250-ton furnaces have been rebuilt to 300-ton capacity; and a third furnace of 500-ton capacity was completed in March 1930. In the fiscal year 1928-29, the persistent operating deficit was finally turned into a small profit thru a program of drastic economies, which included the reduction of wages and the cutting of the price of coal supplied to the plant, and also thru the reduction of capitalization from 45 million to 20.7 million yen. At the same time production was substantially increased, as the following table shows.

Year	Pig Iron Output metric tons	Concentrated Ore Output metric tons	Profit or Loss in yens
1919–20	31,620		−1,487,168
1920–21	75,273		−6,422,577
1921–22	57,184		−2,873,726
1922–23	66,543		−3,198,343
1923–24	72,311		−2,240,897
1924–25	94,501		−2,955,607
1925–26	88,263		−3,719,989
1926–27	162,455	114,021	−3,806,594
1927–28	203,454	231,593	−157,542
1928–29	224,461	257,578	+1,215,611
1929–30	210,443	252,109	+542,603
1930–31	288,433	315,572	−666,633
*1931	126,303	165,812	

* Four months—April to August.

During the last four years for which figures are available (1927-31), operations have been slightly profitable or have resulted in only small losses. This does not mean, however, that the Anshan Iron Works have finally been placed on a paying basis, or that the basic problems of poor location, distance from markets, and low-grade ore have been successfully solved. The profits since 1928 have been purely nominal, due to the reduction of the cost of coal supplied from the Fushun mines of the South Manchuria Railway. It has yet to be demonstrated that the Anshan Iron Works can compete on an economic basis with other plants more advantageously located and supplied with raw ore of high quality.

This leads to the fundamental fact that the Anshan iron development has never been a commercial enterprise, but rather a governmental project inspired by political and strategic motives. It is open to serious doubt whether there is any real economic justification for the large sums which have been sunk in the Anshan Iron Works. From the start it has been a political project, backed by the financial resources of the state-controlled South Manchuria Railway and designed to give Japan a greater degree of independence from foreign sources of iron and steel.

CONCLUSION

It is thus apparent that the independence of Japan's iron and steel industry does not pivot on the question of the political control of Manchuria's iron resources. The success of Japanese arms or of Japanese diplomacy cannot alter the following fundamental facts. Manchuria's iron ore resources, tho nominally large, are of very low grade. It is not economical to transport those poor 30 per cent ores to Japan. Their utilization therefore depends upon the successful operation of Manchurian iron works to transform these ores into pig iron and steel products which can be shipped to Japan. These plants, however, are handicapped by the high costs of treating low-grade ores under a hematite reducing process in which half of the raw ore is lost and of which the commercial feasibility has yet to be shown. For a number of years the two modern iron works of Manchuria have been under Japanese control; yet one has been a heavy drain on the Japanese Government while the other has been a commercial failure. Ninety per cent of their annual production of pig iron is exported to Japan; yet in no year have these shipments exceeded 300,000 tons. For the three-year period 1927-29, Manchuria supplied 33.1 per cent of the value of

total Japanese imports of pig iron; but this represented only 13.8 per cent of the total Japanese supply of pig iron and less than 10 per cent of the total consumption of iron and steel in Japan. Important increases of production in Manchuria are not expected, unless the many problems which surround the profitable exploitation of low-grade ores can be overcome.

MINERAL RESOURCES OF RUMANIA*

JOSEPH S. ROUCEK
Centenary Junior College
Hackettstown, New Jersey

Rumania is today one of the richest mineralized countries of the world. No mineral of any importance exists which cannot be found there. Some minerals, notably coal and iron ores, were lacking in the Old Kingdom until the acquisition of Transilvania* and Bucovina* following the World War. Mining however, is largely undeveloped, except that centering around the production of petroleum and salt.

PETROLEUM

A trip thru the countryside of Rumania is a continual source of joy for the tourist accustomed to the mechanized aspects of our American civilization. The quaint villages and farms together with the beautiful costumes and embroideries are a paradise for the artist.

A visit to the oil-fields of Rumania on the other hand presents a sharp contrast which transports us immediately to scenes of business-like activity, similar to that in the oil-fields of Texas. Indeed, we might imagine ourselves in America when we see in some parts of the fields this sign, "Standard Oil Company of New Jersey," and hear American engineers and experts speaking in English. A typical American tractor, too, is in the scene, alongside of teams of horses and oxen. Here the agricultural activity of the Rumanian abruptly gives way to the feverish activity of one of the most important industries of Rumania. Many of the international relations of the Kingdom of Rumania have been conditioned by the interest of international finance in the "flowing gold" of Rumania.

* Official spelling adopted recently by the U. S. Geographic Board. Editor.

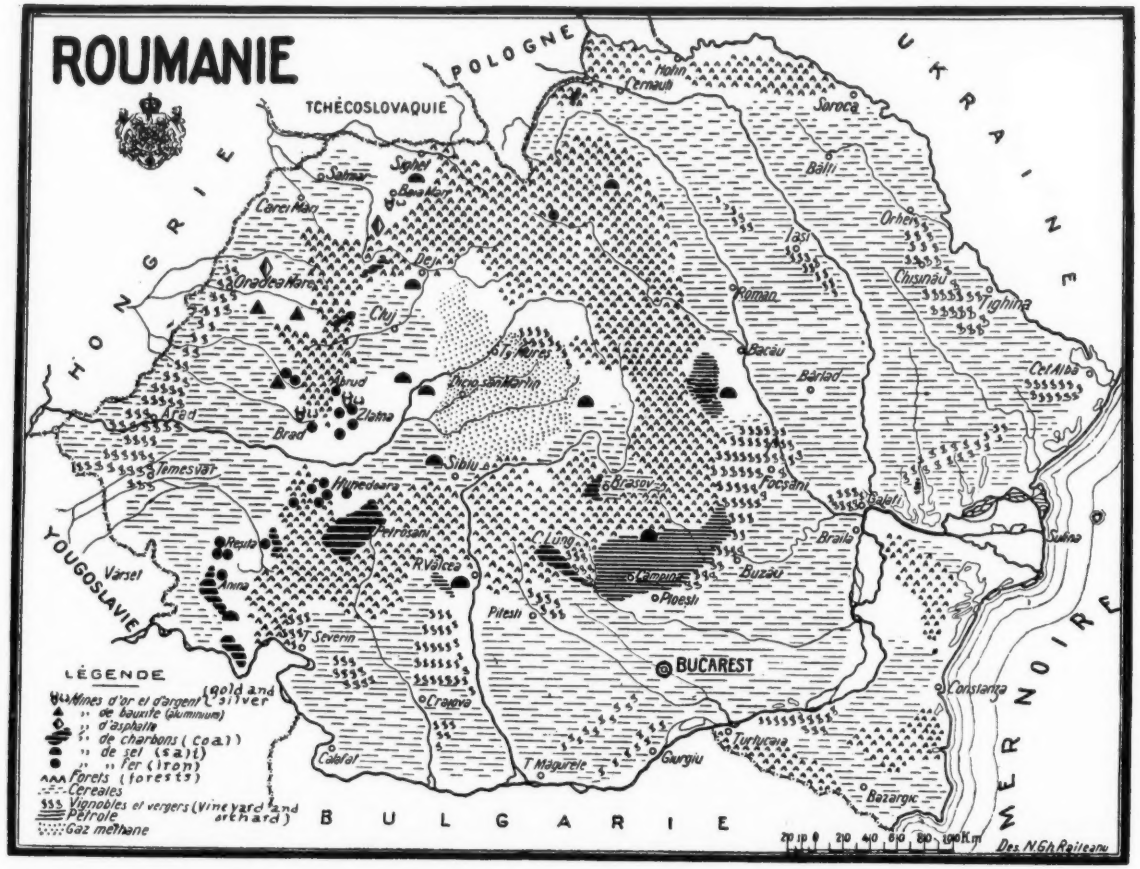


FIG. 1. Distribution of principal mineral and vegetable products. Courtesy, Rumanian Legation, Washington, D.C.

The writer once chanced to witness one of the most destructive fires in the history of the oil industry of the world. This was the fire of Well 160 of Moreni. Millions of dollars were lost by the oil company when on May 29, 1929, the sparks from stones thrown up from the well, ignited the well and took the lives of ten workmen. It was only on September 18, 1931, that an American expert succeeded in putting an end to this fire, after numerous attempts had been made by authorities invited to try out methods used in other parts of the world. The plan of extinction was rather original. As the extreme heat prevented any work around the well, an iron chimney was made, into which the gas of the well then escaped and burned on the top of the chimney. This allowed workmen to dig a tunnel that tapped the well under the chimney, and which eventually led the gas a considerable distance away from the well, where it was harmless. This decreased the pressure of the gas so that before the steam for the extinction of the fire could be used, the land around the well collapsed and ended the terrible damage. It is estimated that about fifteen thousand million cubic feet, worth more than two milliards of lei,[1] were destroyed.

The deposits of oil are known to have been exploited ever since 1550. The peasants were using it in those times as a medicine and as axle-grease. Foreign capital was introduced in the nineteenth century. Exploitation on a modern scale dates from 1890. The production of 50,000 tons in 1890 increased to 500,000 tons in 1904; thus in fourteen years the output was augmented fourteen times. Just before the World War, the production reached the astounding figure of 1,800,000 tons. The official estimate of the total extent of the oil-bearing lands in Rumania is 296,520 acres. But the area under production and drilling amounts only to 8,360 acres. More than a half of the total production comes from the Prahova Valley, and the districts of Moreni, Câmpina, Baicoi, and Bustenari. Oil is found all along the foothills of the Carpathian Mountains on the side of the Old Kingdom from the district of Suceava, in the north, south to the valley of Dambovita, a total distance of about 200 miles. It can be found also at Moinesti (the Bacău district). The main field is at Moreni, where one well yielded over 300,000 tons of oil.

Along with the oil production of Rumania goes the production of

[1] The value of the lei fluctuated greatly during the period discussed in this paper hence the data at different periods are not comparable. From 1923 to 1928 it varied from 184 to 235 to the United States dollar. In Feb., 1929, it was stabilized at $0.0058.

natural gas. The daily output is approximately five million cubic meters. This does not include the production of the Transilvania district of Sărmăsel, Basna, Saros, and Săcel. These gas resources have not all been developed and only about a half of the present oil production conserves the gas for fuel in the oil refineries and in factories producing pottery, glass and chemicals, as well as for illuminating purposes. Mr. F. G. Clapp and Mr. Allen S. Miller,

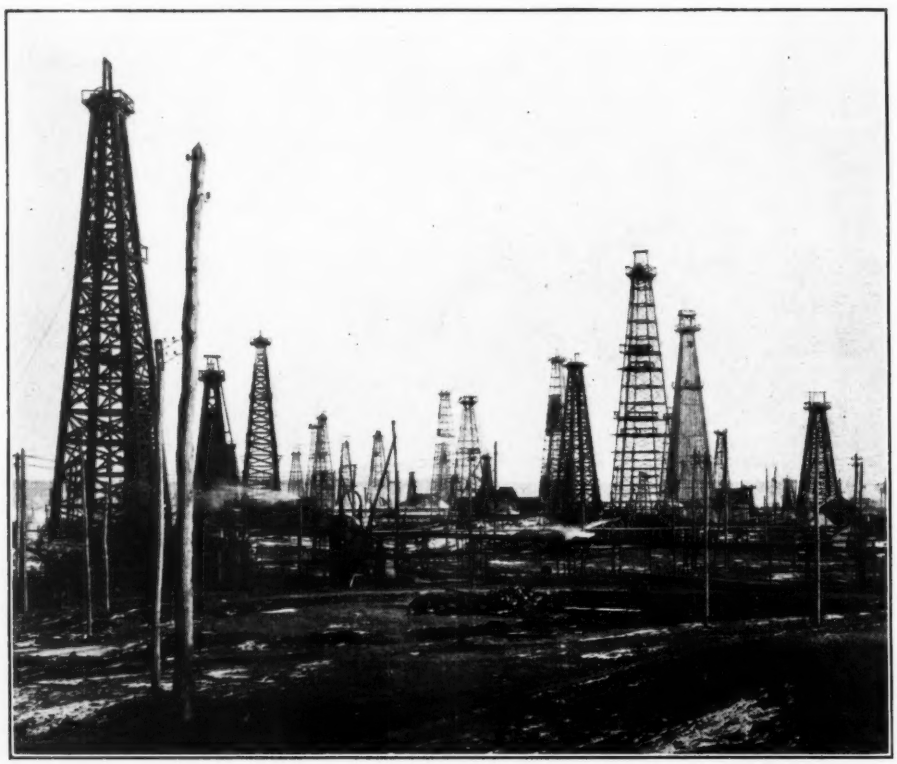


FIG. 2. Rumanian Oil Wells. Courtesy, Rumanian Legation, Washington, D.C.

two well-known American authorities, estimate the reserves at two and a half thousand million cubic feet. The natural gas of Transilvania is especially superior because it is rich in hydrocarbons, containing from 97 to 99 per cent of methane. The complete utilization of the reserves will become one of the most important sources of income and revenue to the owners and the state.

The deepest oil well reaches about six thousand feet. In general, deep drillings seem to be the rule. The drilling decreased considerably during the World War, when the wells and storage tanks were

destroyed to prevent the armed forces of the Central Powers from utilizing them. Since the World War the drilling has been increasing with the exception of the years 1927 and 1928; in 1929 the total number of meters drilled reached nearly a million feet.[2]

About 97 per cent of the Rumanian output is cleansed, distilled, refined and rectified in refineries, whose technique has made enormous strides in recent years. New processes and plants for the distillation and rectification have been invented. There are some thirty large and thirty small refineries, most of them located near the wells, at Câmpina and Ploesti, at Buzău, and at Targoviste. The largest refinery in Europe is located at Câmpina. The increased use of the American system of cracking should improve the yield of petroleum products.

The producing centers are connected by pipe line with their refineries and distilleries. The State of Rumania has constructed 475 miles of four pipe lines, which connect the oil-producing regions with Constanta on the Black Sea, and with the Danubian port of Giurgiu. Over a half of the freight goes directly to Constanta. The State railways assign more than 10,000 tank cars for the transportation purposes of this kind, of which nearly 8,000 belong to the oil companies. The service is well-developed, tho it is rather insufficient for the purposes of foreign exports. The petroleum products need to be transported especially to the remote places of the country.

The home market consumes about 40 per cent of the production, the chief consumers being the state enterprises and industrial enterprises using oil residuum. The main products are benzine, illuminating oil, mineral oil, and mazout.

The exports are, in order of their importance, as follows: mazout, illuminating oil, motor spirit, motorine, mineral oil, and paraffin. The industry must compete abroad with the American and Russian products; both can undersell the Rumanian products. The overproduction, the limited consumption at home, and the world slump have all reacted against the Rumanian petroleum trade, and forced the Rumanian prices to a low level.

The exports are directed to the following countries, grouped according to their importance to the Rumanian seller: Italy, England, Egypt, Germany, Austria, Hungary, France, Yugoslavia, Greece, Bulgaria, Czechoslovakia, and Turkey. But the future is rather dark as far as these exports are concerned, due to the in-

[2] Mihail Pizanty, Petroleum in Rumania, p. 14, Bucharesti, 1930.

creased competition of the Russian exports in the Near East and the future expansion of the Mesopotamian regions.

Before the World War about 99 per cent of the industry belonged to foreign capital, organized under German, British, Dutch, French, and Belgian backing. No definite figures can be obtained now, but it is estimated that Franco-Belgian capital owns about 23 per cent of the total; British, Anglo-Dutch and Rumanian approximately 20 per cent each; American capital 6.6 per cent; and Italian capital less than 2 per cent. American financiers have an important share in the oil enterprises, the Standard Oil Company of New Jersey being represented by the *Româno-Americană* Company, which has a capital of 1,250,000,000 lei.

The oil industry and oil reserves are, after agriculture, the principal wealth of the Kingdom of Rumania. The immense wealth of the unexploited regions point to future prosperity in possibilities of future production and utilization. It seems, however, that foreign investments are absolutely necessary at the present time, because Rumania does not possess the necessary capital. Foreign investors will undoubtedly receive substantial returns on their investments. The depression and the low prices on the world markets have tended to produce a temporary agreement on the part of the Rumanian producers for the restriction of production. The political regime, which nationalized the subsoil in 1924 on the basis of the Constitution of 1923, tended to alienate the interests of foreign capital. But with the passing of the National-Liberal Government in 1928, the new Mining Law of March 28, 1929, put Rumania and foreign capital on the basis of complete equality, tho the basic principle—the nationalization of the suboil—remains the same. In relation to the total production of the world, Rumania participates only to the extent of 2.4 per cent, which is primarily due to the fact that North and South America supply over 83 per cent of the world production. Notwithstanding this fact Rumanian oil fields are of utmost importance not only to the State of Rumania but also to foreign lands and especially to foreign investors who look for profitable fields of endeavor.

Other Leading Mineral Resources

Rumanian salt deposits are sometimes considered the greatest in the world. If Rumania would increase its output, it could supply Europe with salt for centuries to come. The salt-mines under exploitation number eleven, and can be found in various parts of the

country. The apparent reserve is estimated at about nine milliard tons. Salt is second in importance to petroleum and the increased exports will eventually become one of the best sources of revenues for Rumania.

Greater Rumania now possesses quite large deposits of coal. Lignite predominates. Thanks to the mines at Lupeni and Petrosani, the Rumanian State Railways are now freed from the necessity of importing coal from abroad. Bituminous coal also comes from the Banat fields, while lignite is located in the mountainous

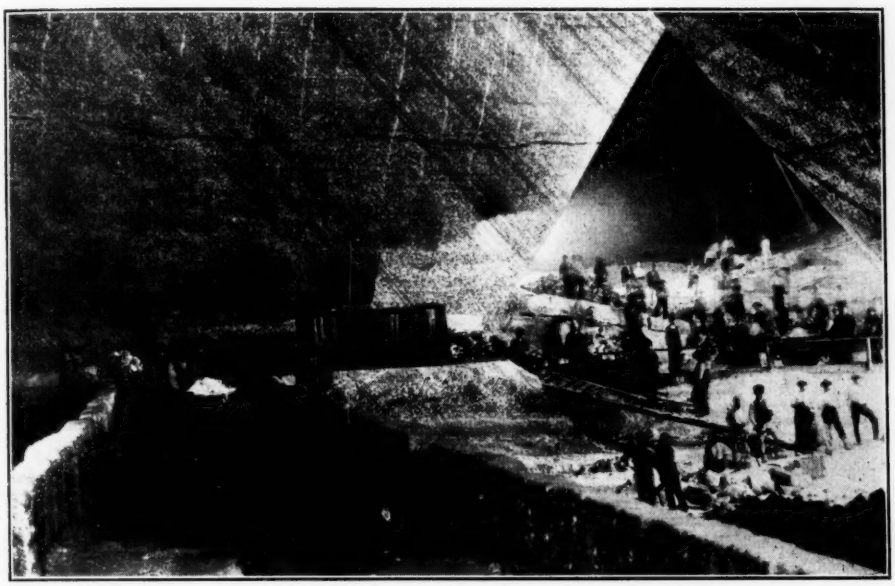


FIG. 3. Salt Mine in Slanic district of Prahova. Courtesy, Rumanian Legation, Washington, D.C.

regions of Moldavia and in nearly the whole sub-Carpathian region of Muntenia. About 85 per cent of the total production comes from Transilvania. The total output can practically take care of the home-consumption, except for special kinds of coal needed for special purposes, such as the metal industries. The monopolistic position of the coal companies, however, has resulted in too high prices and the consequent unemployment of the workers in this field.

The deposits of iron-ores are located exclusively in Transilvania, around the district of Ghelar, and especially in the northern part of the Banat. The principal mines are owned by the State, which works the main deposits, Ghelar, Ruda, Alun up to Vadual

Dobrei, using the output for its foundries at Hunedoara as well as for the Titan-Nadrag-Calan Company. The production of the Banat goes to the Resita Metallurgical establishments. However, the deposits of iron-ore are small in comparison to those of other nations. It is estimated that the deposits will be exhausted in 30-40 years if the normal mining activity continues, tho there are numerous deposits of pyrites. The state undertakings lack effective management and usually work with annual deficits.

The largest deposits of manganese ore are in Jakobeni in Bucovina, and most of its output goes abroad. This mineral is also found in the Transilvania districts of Maramures and Somes and especially in Crisana. The ores are mostly of good quality and are free from sulphur.

The mining of gold and silver is very primitive, and instead of being improved it is rather decadent. These minerals are usually found in association. The richest fields are found in Transilvania, in the northern and central parts of that province and in the region of Baia Mare. The extent of the richness of these deposits is now well known. In the region comprising Sacaramb, Brad, Zlatna and Baia Aires is one of the richest auriferous districts of Europe. To the Sacaramb gold mines goes the distinction of being the only European mine where gold is found in association with tellurium and selenium. Otherwise the gold is mined in complex pyrite ores. Silver, together with lead, is located in the Maramures district (Baia Sprie and Capnic).

Copper is found only in association with other metals, especially in the calcopyrites, including silver and gold. The richest storage is located at Balan (Ciuc), Nistru (Satmar), and Bucium (Alba de Jos). Important massifs of cupriferous pyrites appear in the region of Baia Mare and the Altan-Tepe mines in the Dobrogea.

The output of lead and antimony is very small. The richest deposits of these complex ores are the State mines in the region of Baia Mare. The high cost of mining is largely responsible for the decline of this production.

MINOR MINERAL RESOURCES

Zinc is usually associated with lead, copper, and silver veins. Large quantities appear at Rodna Veche, where the State pyrite mines are found, in the pyrite deposits of the Gutin mountains of Transilvania and Bucovina. Mercury appears in the form of cinnabaryte in the western mountains of Transilvania. The departments

of Bihor and Alba of the same province offer rich deposits of bauxite, containing from 50-70 per cent of aluminum. The Rumanian amber at Buzău is sought by foreign markets because of its richness of color and shades. Asphalt is distributed widely over the country, the most important deposits being in the north-west of Rumania and in the Prahova country in the Old Kingdom. Important deposits of mica are limited to the region of Valea Lotrului in Old Rumania.

Rumania also abounds in numerous mineral lakes and springs, known for their curative powers. The thermal springs are located in western Transilvania, ioduretted springs on the slopes of the southern Carpathians, and alkaline and carbonic springs in the Moldavian Carpathians. They are usually situated in a setting of natural beauty, and thus these health-resorts are usually connected with summer resorts, such as Mehadiva in the district of Severin, Transilvania, Govora, Călimănesti-Căciulata, Olanesti in the district of Vâlcea, Sovata in Mures, and Tekirghiol on the Black Sea. One of the most popular and beautiful summer and winter resorts is Sinaia, not very far from Bucuresti, where the present King of Rumania spends most of his time.

CONCLUSION

With the exception of oil and salt, Rumania's mineral resources are almost entirely undeveloped. The mining of gold, silver and manganese ores is on the increase, but both the private and state works could markedly increase their activities and modernize the methods. Rumania, however, promises rich rewards for future development.

THE GEOGRAPHY ASSEMBLY

RUTH R. WATSON
University of Chicago

Now that the assembly has come to have a recognized place in the curriculum of the elementary school, it may prove profitable to consider what geography has to contribute to the educational possibilities and opportunities of the assembly program. Altho progressive teachers and leaders are coming more and more to agree on the essential philosophy of the science of geography, very little of geography as a science has found its way into the assembly program based upon geography.

The well balanced geography program is able, effectively, to accomplish at least four major purposes. It can show that the function of geography is to describe and explain the relationships between human activities and natural environment; it has an excellent chance to demonstrate the use of geographic tools and to exemplify the geographer's method of attack upon his problems; and, not least of all, does it present an opportunity to interest the audience in the field of geography.

In the attainment of these objectives for a geography assembly, the responsibility rests upon the regular classroom work. This article will point out some of the ways in which the regular geography class work can furnish the requisite outcomes for the assembly, and will then follow this with a description of a specific program based on the routine study of a sixth grade unit.

BASIC OUTCOMES OF GEOGRAPHY UNITS SUITABLE FOR PROGRAM BUILDING

It is the nature of geography that its teaching deals with the interrelations of man's activities and his natural environment. Most courses are now organized to describe and explain why people live as they do in certain regions. As an example, a fourth grade unit might center about the adjustments made by the Egyptians to living in a hot, almost rainless country along the Nile River, and a sixth grade might study the major adaptations made by the dense population of Britain to a natural environment like the British Isles.

The conceptions of these larger adjustments are built up by the understanding of the lesser relationships which in turn are

arrived at by a study of a multitude of well selected details. To be specific, one of the important understandings in the Egyptian unit is the comprehension of the fact that the people of Egypt live as they do because they dwell in a hot, almost rainless land along the Nile. To establish this, the group learns that the Egyptians build houses of sun-dried bricks of mud because trees are scarce and clay is plentiful, that they put flat roofs on their houses for there is little rain, that they frequently use the roofs for out-of-doors rooms as they do not need protection from rain or cold, that they need no chimneys since the winters are warm and all cooking is done outside, that they keep the hot sunshine out of their home by having few outside windows, and thus on thru a series of simple salient items of every day living. In each case the relationship between the activity and the environment is stressed thru ample and detailed descriptions.

In the case of the British Isles unit, one might choose, as two comprehensible aspects of the major adjustments, manufacturing and commercial relationships of the dense population to their environment, the British Isles, and the solution of the food and raw material problems for such an industrial population. The understanding of such concepts is concerned with (1) the essential advantages and disadvantages for manufacturing and commerce, inherent in the natural environment, which have been utilized, improved, and built up by the British; (2) the use of land and water resources to produce as much food and raw material as possible; (3) the dependence of Britain upon other regions for most of its food and raw materials; and (4) the equally vital matters of protecting and maintaining such supplies thru the British merchant marine, the navy, and trade agreements.

Some understanding of definite outcomes, such as the foregoing, form one of the important contributions which geography has to pass on thru the assembly program. Groups of children who have completed a unit with an awareness of their knowledge and comprehension of organized understandings are stimulated by an opportunity to present the results of their findings to their fellow students.

Few assembly periods are of sufficient length to allow the presentation of the whole unit, but one or more of the major understandings may be worked into a program. Thus, instead of an assembly showing all of the important ways in which the Egyptians have fitted their ways of living to their natural environment, one

might choose certain aspects of that adjustment, as how the Egyptians have suited their ways of farming to the country, how such items of everyday life as homes, food, and clothing are adapted to living in Egypt, or the life of Egyptian children. Likewise a program on the British Isles might well be constituted by any or several of the supporting understandings, as how and why so many people are engaged in commerce and manufacturing, why the special industries are localized, or how Britain gets its food and raw materials.

Limiting the program thusly will not preclude the introduction, in developing a concept, of the facts, understandings, materials, or methods of the essential conceptions contributing to the whole. It is merely that the geographic outcomes which are to form the framework of the program must be definitely fixed and limited before the work of building up the assembly begins.

Opinions vary as the part which children may play in determining the basic make-up of the program. However, under the guidance of a teacher who has carefully worked out the geographic objectives to be expected from a given assembly, pupil initiative can be steered into desired channels without the loss of time and learning which so usually results when the judgment of children is too generously deferred to.

Thruout the program planning, care must be taken to see that the several parts contribute their share to the geographic ensemble. For example, one must not lose sight of the fact that, altho fishing and farming *as means of supplying food* might be discussed in an assembly on how Britain gets its food, the discussion of neither fishing nor farming are ends in themselves. Often, much material, intrinsically valuable and interesting must be eliminated, if it takes the subject too far afield and throws the program out of proportion. Children, as well as teacher, must keep the aims of the assembly well in mind.

The following description of a sixth grade assembly will suggest various uses of devices and materials and will indicate a type of organization that has been found successful.

A Specific Assembly for Sixth (or Seventh) Grade Level

This assembly is based upon one section of a British Isles unit, the food and raw material problems, and will not attempt to show the manufacturing and commercial adjustments which the British have made to their environment, but, thruout, the program will assume that this has been already studied.

It seems best not to give a verbatim report of the assembly, nor detailed directions for the use of materials. Before beginning the description, certain general hints as to sources of data, making and handling of illustrative materials, and the mechanics of running an assembly may be of value.

Data for the grafs and maps came from the leading textbooks, the Statesman's Yearbook, and other almanacs, but the most valuable single reference was the publication of the United States Department of Commerce (Bureau of Foreign and Domestic Commerce, Trade Promotion Series No. 94) entitled The United Kingdom, An Industrial, Commercial, and Financial Handbook (944 pp).

In making grafs, it should be remembered that children at the elementary school level are not very interested in quantitative data as such, but they are intensely attracted by all forms of grafic illustration. Even when constructing grafs, with children it is the interpretation rather than the numbers which matters. Their interest, for example, centers in the fact that one nation has more than another, or that one commodity is greater than others, as shown in the lengths of lines, colors, etc., rather than in the number of tons, dollars, or miles involved. Figures become merely the tools with which they measure lines, spaces, circles and colors. In view of these facts, it is hardly necessary to say that the figures provided for the grafs should be in round numbers only, hundreds, thousands, millions, or billions, and that numbers too large to be conveniently grafed may be reduced to usable proportions without destroying relative values by dividing each by ten or some multiple of ten.

For handling grafs and charts, results are better if a child can hang his up, then step to one side and point out and explain it. An ordinary picture wire stretched taut across the platform from side to side near the front is very serviceable, especially if the child has already fastened a bull-dog clip to the corners of his graf. Failing a wire, or a movable bulletin board to pin to, one of the children may hold the graf about as high as his own head while another explains.

Maps which the children are accustomed to using in the classroom are ofttimes difficult to transfer to the assembly room. If the map is on a roller or in a small case, it is practicable to remove these from the wall, balance the case or roller over a movable blackboard or an upright piano, pull out the map and display it to the audience over the blackboard or down the back of the piano.

The aforementioned wire may be used successfully if the map is not too unwieldy.

Pictures which cannot be clearly seen by all of the audience, must be described in some way to show what the speaker is using the picture for. It is probably well to limit the number of pictures so used, but some are very necessary as they represent a very important geography tool. When space permits, it is very effective to display in the assembly room additional, well mounted and selected pictures, book list posters, drawings, models and grafs made for the unit by the group in their spare time. Before the program is over, attention may be directed to these and the audience invited to see them.

It is probably needless to say that, in so far as practicable, each child should have a share in preparing or presenting the materials of the assembly, and, that on the occasion of giving the program, the performance be entirely in the hands of the children while the teacher becomes one of the audience. Nor should there be need of announcing each child's part, as it should fit naturally into its place in the program story.

In the following account, the statements immediately after the Roman numerals constitute the major geographic understandings or outcomes. (In the case of number III, these had to be followed by three sub-divisions for efficient handling.) These understandings were worked into a talk by the children and then were followed by all or several of the illustrative materials. Just as effectively the devices may be given first and lead directly to the understanding, or what is usually more successful, the statements of the understandings may come both before and after the contributing materials. In some cases the type of talk found valuable is suggested in quotations. No suggestion as to how many children should present the different sections of the program is made.

THE PROGRAM—HOW BRITAIN IS FED AND CLOTHED

To introduce the program, a child explains a little about the unit on which the class have been working and tells on what the program is based.

Because of the confusion over names used in connection with Britain, two children demonstrate, by means of maps and by writing on the blackboard, the use of the terms British Isles, Great Britain, Scotland, England, Wales, Ireland, Irish Free State, Northern Ireland, United Kingdom, and the British Empire.

I. Great Britain is a small country with a dense population which earns its living chiefly by manufacturing and commerce. A very few of the people are producers of food or raw materials.

Suggestions and devices:

1. The area of the United Kingdom is equal to that of New York and Pennsylvania, but the population is equal in number to the combined inhabitants of New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Florida and Georgia. To show this do some, or all of these:
   Point out the places as named on a large map of the United States and Europe. Use nearly the same scale as possible.
   Use map, made by children, of the United Kingdom superimposed upon the states named.
   Use map, made by children, of Britain with dots to represent population; of the states named above with dots representing the same number of people (same scales).
   Pin a cutout map of Britain upon a map of the United States of the same scale.
   Use a blackboard map of the United States. Outline New York and Pennsylvania as a unit. Have the United Kingdom outlined on it very lightly beforehand, and now chalked in rapidly.
   Use maps, made by children, of the United Kingdom and New York-Pennsylvania on the same scale.
   Point out on the wall maps that the average north-south distance in Britain is about the same as from Albany, New York, to Norfolk, Virginia, and the greatest east-west distance is approximately that from Pittsburgh to Philadelphia.
   Use grafs to show that the total area of the United Kingdom equals one-sixtieth of that of the United States; the population one-third.
   Make grafs to show the area of Britain and that of the states whose population is equal to its.
2. Show that the gainfully employed people in Britain were chiefly engaged in commerce and manufacturing, and relatively few in farming, by grafs for the United States and the United Kingdom. (Use same colors for the same occupations. U.K. handbook, p. 25).
3. Concluding statements. "As you have seen, Britain is a very small country with a great many people. If you divided the whole country equally among the people, each person would receive about one and two-ninths acres, or less than the size of two football playing fields. If the population were scattered evenly thruout the United Kingdom, there would be 469 people living in every square mile.

   "Even if all of Britain were good farming land, there would hardly be room enough for people to raise the necessary food and raw materials. It is said that the value of food which Britain buys from other lands is twice the value of the food which it produces itself. Someone has figured that Britain produces enough food to feed itself for two days out of every week, and there would be many kinds of food which it would not have."

II. The biggest proportion of important foods and raw materials comes from other countries.

1. Show by bars what Britain buys from the world, 80 per cent of its wheat, 100 per cent of its cotton, etc. (U.K. handbook, pp. 518-519).
   (If the bars are made on large sheets of cross section paper, a bar 100 spaces long may represent the total amount of each product, and the percentages bought from other nations and produced at home may be easily colored in. With a simple explanation, children can do this understandingly, even if they have not studied percentage.

It is effective to group all foods on one sheet and all raw materials on another. If the same two colors are used in each bar, there is a cumulative effect of the great proportion of the products which Britain has to import. The child who explains the graf, calls attention to the proportions, not to the actual percentages.)

2. Child reads from "The United Kingdom" (handbook, pp. 363-4, 361, and 383) statements regarding the source of raw materials for the leather, linen, and paper industries, and he may ask the audience to be ready to say, when he is thru, whether the bars for these industries would show more raw material imported or grown at home.
3. Concluding statements. "You can see by these charts and by the sentences which were read that Britain produces only a small part of its food and raw materials at home and that it must get most of them from other countries. In the rest of the program we will show you how it does this."

III. Britain produces some food and raw materials from its productive lands and nearby waters. Altho it has some farmlands and rich pastures, only one-tenth of its people are farmers. The chief farm work is stock raising, for the land is better suited to that than to other kinds of agriculture.

1. Much of the land is in highlands and cannot be easily cultivated. The land over one thousand feet above sea level has summers too cool and wet to grow any crop except grass. Thus the better grasslands of the highlands support cattle and the poorer ones sheep. Some of the wetter western lowlands make better cattle than crop lands. In some places the cool, moist summers favor the growth of crops to feed stock. In favored areas, the grass grows during the mild winters and the cattle need no shelters.
   Point out the highlands on the physical map.
   Show pictures of Scotch, Welsh, or English highlands. (In a small assembly room, 5" x 8" photographic prints with distinct peaks carry fairly well. Pictures drawn by children are, perhaps, more effective. Attention should be called to the lack of level land except in the valley bottoms.
   Use summer and winter rainfall map (wall chart or one made by children), to point out heavy rain in the mountains and in the west.
   To show the mild winters, use a map comparing the January temperatures in the United States and Britain (U.K. handbook, p. 78).
   Use map, or slide, of cattle and sheep distribution to point out their wide spread prevalence with reasons for massing in certain districts.
2. Much of southeastern England is warm enough and dry enough for profitable farming. The important crops are the grains—wheat, oats, and barley; beans, peas, hay, rutabagas, turnips, mangolds, and potatoes. Truck gardening is important near the cities.
   Use map of distribution of wheat in connection with rainfall map.
   Show widespread distribution of oats in the warmer, drier as well as the cooler, rainier sections.
3. Fishing. The long seacoast, with its many harbors and cool waters abounding with fish, help to account for the thousands of fishermen. Altho the British catch enough fish to supply much of their own needs and to sell to other nations, they import much of the fish they eat. They sell fresh and dried fish and canned herrings, but buy canned salmon, sardines and other fish.
   Use a large map of the British Isles to point out the long, irregular coastline and the important fishing ports.
   Use the Europe and North Atlantic maps to show the chief fishing grounds.
4. Concluding statements. "Altho Britain has made good use of its really excellent farm and pasture lands, as well as its sea resources, it has not been able to supply

food for all its millions of people. What it can not produce it must buy in great quantities from other nations.''

IV. To make money to pay for food and raw materials, Britain sells manufactured goods and coal. It makes money by carrying freight in its ships for other countries, and by loaning and investing money in other lands.

Graf to show that 80 per cent of the total value of exports, in 1928, were manufactured goods.

Line graf to show ten leading exports, of which coal is fifth. (U.K. handbook, p. 514).

Talk on ''Invisible Exports.''

Use graf showing rank of the leading five nations in merchant marines.

A problem in addition and comparison. Have arranged on a blackboard or a large sheet of cardboard the following items as an addition problem: Money earned by Britain—Shipping (1928) 650 million dollars; Overseas investments (1928) 1925 million; Interest on loans (1929) 325 million; Exported manufactured goods (1927) 2800 million; Selling coal (1928) 195 million. Add either before or during the assembly. Opposite the problem make the note that Britain's imports in 1928 amounted to 5239 million dollars.

''You will see that the figures are not all for 1928. This one is for 1927 and this for 1929. So the answer will not be exactly what Britain earned in 1928, but it will give some idea of whether Britain earns enough in an average year to pay for its imports.

''When a nation earns as much by selling, or exporting, as it spends for imports, we say that its trade balances. Its export trade balances its import trade just as you might balance two people on a see-saw.

''If a nation spends more than it earns, the balance is unfavorable and the nation may go in debt. If it sells more than it buys, then the balance is favorable and the nation is likely to be prosperous.

''For nearly a hundred years, Britain has had a favorable balance, but the poor business all over the world lately has upset that balance. One of the ways in which it is trying to get its balance favorable again, is by trying to get nations to promise to buy certain things from it if it will buy from them.''

V. Britain makes sure that there will be ships to bring its food and raw materials by owning a great fleet of freight or cargo ships, called the merchant marine. To protect this, it keeps a powerful navy.

Use merchant marine graf again.

Use graf to show that one-third of all the available space for ocean freight is under the British flag.

Show pictures and maps of English docks to illustrate how Britain improves its ports to make it possible for ships to bring its supplies.

Show how the navy guards the trade in nearly every section of the world by pointing out the naval bases. (These may be indicated beforehand by pinning little colored flags or other markers to the map.)

Have child explain something of what Prime Minister MacDonald meant at the London Naval Conference when he said, ''England is its navy, and the navy is England.''

Concluding statements. ''You see that Britain is dependent for its very life and the lives of its people upon being able to have its own ships to bring safely into its ports supplies from all ports of the world.''

Britain's food and raw material situation in pictures, poems, and map devices makes a fitting conclusion.

1. Show pictures of cartoon type made by children. An effective one by a little girl is called "Mother Britain Goes Shopping" and depicts a modern housewife, tagged Great Britain, shopping at a counter on which are displayed foods. Britain is saying to the clerk (labeled foreign nations), "I always have a lot to get from everywhere. My family is so large and hungry." To this the clerk replies, "You buy more than any one else."

Another more diagrammatic picture shows a high post, flying the British flag, and marked "Trading Post." To one side are shelves with containers marked cotton, wool, food, wheat, horse hides, rubber, and coffee. Over these a small flag says, "For Sale, Raw Materials from the British Colonies." A similar arrangement on the right under a flag marked "For Sale. Manufactured Articles from England," shows sweaters, dresses, cotton cloth, locomotives, etc. These are but suggestive of ideas that might be used.

2. Use some of the following to show that Britain is dependent upon the world for markets in which to buy and sell.

Show on a world map the leading sixteen countries to which Britain exports (U.K. handbook, pp. 515, 521); or where it buys certain articles (21 foods and raw materials are listed in "Nations as Neighbors," Packard and Sinnott, pp. 281-284); or the fifteen leading countries to which it sells coal (U.K. handbook, p. 100).

Various devices to show this are effective and may be prepared ahead of time or done by the children for the audience: the countries needed may be colored in and straight lines drawn directly from them to Britain, or lines may be drawn along the probable water routes to Britain; the countries may be heavily outlined and some symbol placed in or near it, and the lines used or omitted; symbols or arrows may be pinned or drawn on the map; strings or paper arrows may be pinned or pasted from Britain to the countries. (Gummed linen mending tape or paper may be used to cut lines or symbols for use on maps which do not need to be used again.)

3. Two poems by an Englishman. "Rudyard Kipling wrote this poem about three kinds of ships—the liner, a ship which runs on a regular route and carries chiefly passengers and valuable express cargo, the Man-of-War, a battleship, and the cargo ships which carry the freight. He talks of them as tho they were persons. When I come to the part which you think tells how important Kipling thinks the cargo ships are because of what the Man-of-War does, will you put up your hand? The poem is called 'The liner she's a lady—.'

"Kipling wrote another poem called 'Big Steamers,' in which Britain and the steamers are having a conversation. I will represent Britain and Harry will be the steamers. The Channel mentioned in the fifth verse is, of course, the English Channel, Looe is a fishing port where pilchards, a kind of fish are plentiful, and the cities named are Melbourne, Vancouver, Hobart, Hong Kong (Victoria) and Bombay (pointing on map)."

The "Big Steamers" repeats slowly the last six lines and asks the audience if they think that Kipling was right, and then tells them that they may find these poems in the Kipling's Verse Inclusive Edition, pp. 756 and 181.

SUMMARY

This description is merely suggestive and does not begin to show how the talks and various devices must be handled by the children to make clear to the audience the geographic relationships involved, but it should, at least, indicate that children can attain certain goals in the assembly. For themselves and their audience they can bring the realization that geography deals with the adjustment of men's activities to their natural environment, the understanding, elementary tho it may be, of a fundamental problem of another nation than their own, and a glimpse of the interdependence of the regions of the world. For themselves, also, by the very preparation

and presentation of the program, they can add somewhat to their ability to think geographically from data furnished by books, maps, pictures, grafs, experiences, etc., and to their ability in using such geographic tools in presenting to an audience their understandings and comprehensions.

If ends such as these are achieved, then geography is able to offer, thru the assembly, a contribution which can be attained thru programs based on no other subject.

TEACHING URBAN GEOGRAPHY IN THE ELEMENTARY SCHOOLS

JULIA M. SHIPMAN
Mount Holyoke College

INTRODUCTION

The presentation of the cities of the world in such manner that each will have individuality or personality is a problem which every grade school teacher of geography faces. Modern geography is taught as human geography and people more and more are living in urban groups. From a superficial point of view all these agglomerations of people are alike and becoming more so, yet anyone who has lived in two or more cities will tell you that each has its own characteristics. Let us consider some of the tangible facts which the teacher may discover and present to her class in geography or lead them to search out for themselves.

LOCATION

Every city taught should be located on one or more maps and its definite situation discussed from several angles. Its latitudinal, continental, national, and state location may be read. The city may, at this time, be considered as one of a group, that is as one of the Great Lakes cities or one of the Baltic seaports.

After the rather obvious factors of situation are noted, the study of a more detailed map should reveal some of the individual points of location which we call *site*. Site implies a consideration of local topographic features over which the town spreads, especially those which affect town planning. Thus Philadelphia is on both banks of the Schuylkill River where it enters the Delaware.

Copenhagen is an excellent harbor on an island east of the mainland of Denmark. Marseilles is east of the mouth of the Rhone where higher land affords a better place for building, and hills offer some protection from northern winds. Seattle is around lake Union and between Eliot bay and lake Washington. Vladivostok lies along an inner bottle-necked harbor where surrounding hills form an ideal protection from winds and storms. Such information about site may be obtained by careful reading of topographic or other large scale maps.*

In connection with detailed map study the teacher may present facts of historical geography, especially those concerned with the beginnings of the city or its earliest growth. Pittsburgh began with a fort and trading post located where the Alleghaney and Monongahela rivers unite to form the Ohio. Its first growth was the result of boat traffic on these three rivers. Venice was an island of refuge for the Venetii fleeing from persecutors on the mainland; the later importance of the Adriatic sea in trade made commercial growth almost inevitable in a location where goods carried either by land or sea must be transhipped. London began at that point on the Thames River where there was a ford and later the first bridge above the river mouth resulting in the convergence of land highways at this point.

City Planning

Detailed city maps also show some phases of city planning which add to the specific knowledge of the city. Whether a city is expanding more to the north or in some other direction may be discovered, together with the more obvious reasons. San Francisco can build only toward the south because of water on the other three sides, while Milwaukee must expand in some direction other than east. The use of various heights within the city limits for residential

* It is advisable for each teacher to keep a card catalog at hand where she can record facts about each city to be studied. The name of the city should be placed on the top line of the card and the source of information and data below. If preferred two or more cards may be used for each city, one being reserved for references found in books easily available, thus:

Chicago.

1. Branom and Ganey: Western Hemisphere. p. 115-117, and illus.
2. McMurry and Parkins: Adv. Geog. p. 79-82. map p. 82.
3. Smith: Human Geog., Book Two. p. 165-166 and airman's view.

On the other card may be recorded data gleaned thru printed material not easily available, or collected from conversations or thru travel.

districts gives Cleveland individuality. The layout and naming of the streets in our national capital should be noted and may be contrasted with an old city like Boston whose downtown streets were evolved before city planning was in vogue. Boston streets are a response to the curves of Beacon Hill and the surrounding waterfront or perhaps to cowpaths, as tradition has it. In many older cities the streets are parallel to or at right angles to the waterfront without regard to orientation.

Each city has one or more important arterials, some of which are so often referred to in print or by travellers that they should be associated with their correct location. Broadway, Michigan Boulevard, Princes street, Unter den Linden, the Champs d'Elysée and the Strand may serve as examples.

CLASSIFICATION

Further information concerning the type of city and its industries or points of interest must be largely gleaned from textual material. Cities may be placed in a few general types as manufacturing cities, commercial cities, or, as is more common, a combination of these two, such as Hamburg or Baltimore; fishing ports like Gloucester or Hammerfest; health resorts such as Asheville or Hot Springs; political centers like Washington or Canberra. The capital of every state and nation is in a sense a political center, but nearly all come under some other classification also; thus Praha is a manufacturing center and Rome a religious center.

Other types of cities include mining centers like Butte or Scranton; quarrying centers as Barre or Bedford; educational centers as Oxford or Boston. We also speak of residential suburbs as Brookline or Germantown, or of college towns like Princeton and Wellesley, and of tourist resorts as Miami and Bar Harbor. The manufacturing cities may be subdivided according to their leading industries like Grand Rapids and Rockford for furniture, or Akron for rubber goods. Many cities have such varied manufactures that no specialization is obvious in which case products leading in tonnage or value or the industries leading in number of employees should be listed.

A few cities because of their industries or for other reasons have nicknames or slogans which help to give them individuality as Hartford the Insurance City, or Denver the Gateway to the Rockies, or New Orleans the Crescent City, or Medora Where the

West Begins. In crowded courses of study, little time is available for further detail about most cities. However it seems advisable to study at least one city each term with as much thoroness as available material permits.

DETAILED STUDY

Beginning with the study of continents in perhaps the fifth grade, the first city studied in detail may well be the one in which the children live or the one with which they are somewhat familiar, should they be country dwellers. This detailed study of the home city will then serve as a measuring stick for other urban areas discussed during the term and serve to make them real places where people live and work rather than mere dots on the map or words in a textbook.

The relative size of cities, twice as large or one-fourth as great, means more to most children than population figures. Two cities may be compared as trading centers, and as distributors of goods to their surrounding neighborhood. The chief function of many a small city is the collecting and distributing of goods, while others also serve as railroad centers and have railroad repair shops as their leading industry.

If a city has been zoned by nature or man, many geographic responses may be discovered thru questions. Where is the wholesale district and why there? Where is the manufacturing district? What is its source of power? How are raw materials for manufacture brought to the factories? Where are the residential districts? Why is there usually more than one? Do the railroads follow topographic features such as stream valleys? If the city is on two sides of a stream how and where does traffic cross the water? Is the city water supply, domestic or industrial, a factor in zoning? Why? Does the city have public parks? Where are they located? Why there?

Comparison and contrast of two neighboring cities may bring out information not otherwise emphasized, such as the fact that Minneapolis is noted for its flour mills while St. Paul has none. Further detailed study of cities visited by members of the class or their families may reveal the leading building material used or some peculiar type of architecture. Alaskan cities for example are constructed almost entirely of wood, even including sidewalks, tennis courts and some highways, while in other parts of the world bricks may be almost equally in evidence. Historical shrines such as

the Liberty Bell and Bunker Hill monument may be associated with their proper setting. Actual or imaginative trips to different types of industries should prove worth while.

CORRELATION

If the instructor teaches subjects other than geography there is much opportunity for correlation. Different forms of city government may be studied in the political science class, or historical pilgrimages may be worked out in history. The great art centers of the old world and their treasures are worth studying in the art classes, and nature study may include mention of shade trees characteristic of different climatic zones. In literature visits to the homes of favorite authors may be planned and even the arithmetic class can study figures gleaned from city statistics.

Such correlations do not belong to the class time assigned to geography, nor does the reading of books of travel. Geography periods are few and precious and should be reserved for class discussions, reports or tests based on definite reading carried on in the study period or outside of school. The teaching and drill necessary for intelligent map reading does belong to the geography period, and so does the planning and assigning of work. Modern education tends more and more toward individual responsibility, and geography offers splendid opportunity to develop research and reasoning. Geography material well presented carries over into the after-school days whether one stays at home or travels afar. Its aim is not to give complete information but to train in right habits of thought and research. Let us help the boys and girls to visualize the cities and villages where their fellow men live, as real places with different geographic problems involved in each one.

PRINCIPLES

Teachers should realize that geographic principles may be applied to cities as well as to other phases of geography. The geography of a whole region may be interpreted thru a study of its cities, and they should be taught as an outgrowth of the region, not as separate entities. Some of the principles referred to are the following. Every city is interdependent upon its surrounding area and on other more distant areas also. Cities are usually found along water highways. Cities tend to develop at points where rivers are easily crossed. Cities tend to grow up wherever there is a break in

transportation. Cities frequently develop at the junction of two differing regions.

SOURCES OF MATERIAL

1. Maps both large and small scale, found in most atlases and many textbooks. They may also be obtained from advertising material, magazines and newspapers.

2. Textbooks for general material, sufficient for most cities but too brief for detailed study.

3. General books of information useful for special reports, such as books of travel and encyclopedias.

4. Magazine and newspaper articles.

5. Pictures, from many sources. (Study the use made of pictures in the Barrows and Parker geographies, also read Chapter V in "Man in Europe" by Mark Jefferson, for suggestions on the kind of teaching that should be carried on in a geography class by means of pictures.)

6. Definite questions may be sent to Chambers of Commerce regarding most American cities. A collection of advertising booklets should be part of the equipment of each class room.

7. Principles. Chapter VI in "Geographic Principles" by D. C. Ridgley deals with geographic principles applied to North American cities.

TEACHING THE LENGTHS OF PARALLELS

SAM T. BRATTON
University of Missouri

It is quite generally understood that the distance around the earth along the equator is approximately 25,000 miles[1], and that distances around the earth along parallels decrease toward the poles. That is, parallel circles are progressively smaller than the equator circle. But suppose one traveled around the earth along the parallel of 45° North, what would be the length of the journey?

Students, and perhaps teachers, too, without careful thought might suppose that such a journey would be one-half as long as an equator journey, inasmuch as the parallel of 45° is just half-way between the equator and the pole. Not so, however. The application of the mathematical law regarding proportional lengths of circumferences of circles will immediately apprise us of our error. We know that the circumference of a circle is 2 x 3.1416 x its radius, or $2\pi r$. Hence the circumference of the equator circle may be expressed as $2\pi R$, and of the parallel circle of 45° as $2\pi r$. The ratio, or relative, lengths may be expressed as

$$\frac{2\pi r}{2\pi R}, \text{ or } \frac{\text{parallel circumference}}{\text{equator circumference}} = \frac{2\pi r}{2\pi R}.$$

As the symbols 2π are common they may be discarded leaving the equation

$$\frac{\text{parallel circumference}}{\text{equator circumference}} = \frac{r}{R}.$$

Hence the circumferences are proportional to their radii. For example, the circumference of a circle whose radius is 6 is just twice as long as that of a circle whose radius is 3. Now if we knew the value of the ratio between the radius of the parallel circle of 45° and that of the equator circle our problem would be solved. The drawing and explanation may make the solution clear.

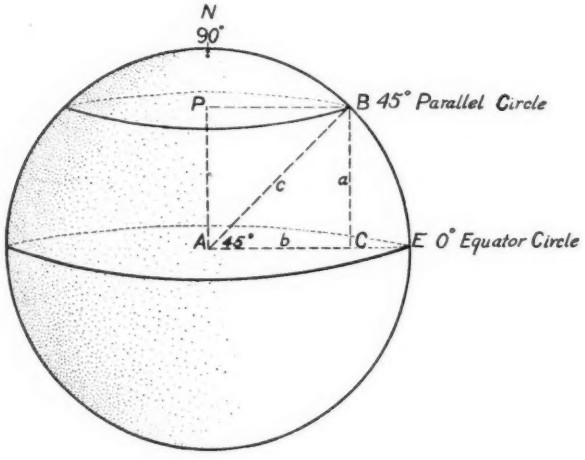
In the figure the distance from the equator, of the parallel of 45°, is the length of the arc EB. This arc is measured by angle A(45°). In the right triangle ACB the length of side b in terms of side c is .7071. That is, the value of the ratio $\frac{b}{c}$, for an angle of 45°, is

[1] For the purposes of this paper the number 25,000 is used rather than the more nearly correct number 24,901.6. Also, the earth is assumed to be spherical.

.7071. Now, side b is equal to the distance PB[2], the radius of the parallel circle of 45°, and side c is equal to the distance AE, the radius of the equator circle[3]. So the value of the ratio $\frac{\text{parallel radius}}{\text{equator radius}}$ is the same as the value of $\frac{b}{c}$, or .7071. Therefore,

$$\frac{\text{parallel circumference}}{\text{equator circumference}} = \frac{.7071}{1}.$$

Knowing the equator circumference to be 25,000 miles, the solution



of the equation is: parallel circumference = .7071 x 25,000, or 17,677 miles. Hence to find the length of the parallel circle of 45° we merely multiply the length of the equator circle by the value of the ratio $\frac{\text{parallel radius}}{\text{equator radius}}$ for the angle of 45°. Thus to find the length of any parallel circle we need to know the value of the ratio

$$\frac{\text{parallel radius}}{\text{equator radius}}$$

for the angle of latitude of that parallel. Printed tables give such values for many angles. A few are given in the following table. These values multiplied by 25,000 will give the lengths of journeys around the earth along the respective parallels.

[2] Opposite sides of a rectangle are equal.

[3] Assuming that the polar circumference and equatorial circumference are equal.

Latitudes of parallels	Value of $\frac{\text{parallel radius}}{\text{equator radius}}$[4]
0°	1.000
5°	.9962
10°	.9848
15°	.9659
20°	.9397
25°	.9063
30°	.8660
35°	.8192
40°	.7660
45°	.7071
50°	.6424
55°	.5736
60°	.5000
65°	.4226
70°	.3420
75°	.2588
80°	.1736
85°	.0872
90°	.0000

The numbers in the value column are the lengths of the radii of the respective parallel circles, in terms of the length of the radius of the equator circle. Referring again to the figure one readily observes that if the parallel to be computed is zero latitude, such parallel coincides with the equator, and side b of the right triangle ACB coincides with and is equal to distance AE, or equator radius. In this case the value of the ratio $\frac{b}{c}$, or $\frac{\text{parallel radius}}{\text{equator radius}}$, is 1, the cosine of 0°. Also, that if the parallel to be computed is 90°, side b disappears and the value of the ratio $\frac{\text{parallel radius}}{\text{equator radius}}$ becomes zero. It may be noted, also, that the value of the ratio $\frac{\text{parallel radius}}{\text{equator radius}}$ for the parallel of 60° is .5000, hence the length of the parallel of 60° is just one-half the length of the equator, altho the parallel of 60° is not at the half way mark between the equator and the

[4] These values are cosines of the latitude angles of the parallels.

pole. Thus one finds that lengths of parallels from the equator to the poles vary from 25,000 miles to zero miles, and that such variations are proportional to the values of the ratio $\frac{\text{parallel radius}}{\text{equator radius}}$ for the latitudes of the parallels, and not to fractional distances of the parallels from the equator.

IN A CHINESE HARBOR

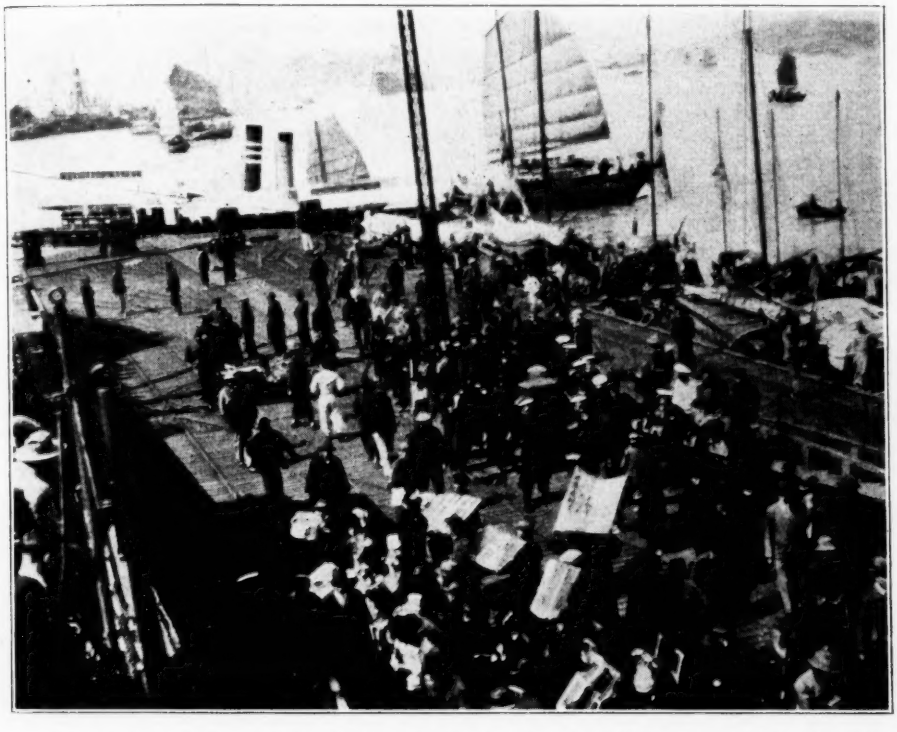
O. D. VON ENGELN
Cornell University

Hong Kong is second only to Shanghai among Chinese ports. Shanghai is international, Hong Kong is British, Port Arthur is Japanese. Foreigners either singly or collectively have taken possession of the most important harbor sites on the coast of China.

But even if the great commercial ports of China are not under Chinese control, the Chinese and Chinese life are nevertheless very much in evidence on their waters. This conspicuousness of the Chinese in the seaports of China is quite a contrast with the seeming absence of Japanese and similar sights in the commercial ports of the Land of the Mikado, Yokohama and Kobe. Why are they lacking? Well, because the Japanese are severely big business and very modern in their harbor arrangements for overseas trade. Also there is singleness of purpose. Japanese ports are intended to serve the interests of Japan only. In the Chinese ports, on the other hand, it is a business of the meeting of races and nationalities. The Chinese are permitted to swarm over, in, and around the treaty ports with junks, houseboats or anything available in the way of water-going craft. The Japanese ports are severely patrolled by customs officers and other police and it may be supposed that the commander of a Japanese fishing boat with lattern sails would not think of intruding in such waters. And it would outrage official Japan to have a lot of skiff-stuff bobbing around in a commercial harbor.

So the tourist finds his appreciation of the animation of the Chinese ports heightened by an experience of the dullness of Japanese docks. As a ship slowly approaches her berth in Hong Kong she is literally beset by small native craft, chief among which are those sent out by the keepers of rival Chinese boarding houses. The solicitors aboard the agency boats hold aloft gay paper ban-

ners covered with Chinese characters. This solicitation is continued at the dock, as shown in the picture, by agents not sufficiently affluent to make their approach by boat. Presumably the signs describe the advantages of supremely good rice and rates astonishingly low by the day, week, or month. This high power sales work is directed to the Chinese steerage passengers crowded in the bow of the ship. The system seemed to be that when a prospect com-



The harbor of Hong Kong, China. In the foreground solicitors for Chinese boarding houses are holding up paper advertisements to attract guests from among the third class passengers on the steamer just docking. (Photo by O. D. von Engeln.)

mitted himself a paper roll was tossed up to him; the acceptance of the scroll being in the nature of signing a contract. Perhaps these newcomers were seeking jobs in the Hong Kong firecracker factories which are leaders in that industry. They were prosperous even in the bad year of 1931 during which over one million dollars worth of firecrackers were exported from Hong Kong.

Other, smaller, craft had family crews eagerly scavenging the garbage from the galley chute, a business managed with small dip nets at the ends of bamboo poles. A Chinese wife missed an espe-

cially choice bit, snapped up by a rival, after the husband had expertly maneuvered the boat to give the wife the advantage and first swoop—and how the husband expostulated!

The larger Chinese junks are quite invariably outfitted with a pair of enormous, brilliantly painted, knob-like eyes. These are set in the bow of the vessel and look down on the waters ahead. It is the responsibility of the eyes to make clear to the evil spirits of the waters that the vessel and its human occupants are on the alert, hence not to be molested with impunity. The scheme probably works at least as well as buying stocks for a profit, a common practice in America.

WANGEROOG

O. D. von ENGELN
Cornell University

Wangeroog is at the eastern end of a long chain of low islands. Previous to January 16, 1362, three of the larger ones of these islands were united. On that date there was a great marine flood which separated them. In 1597 there were 29 small islands in the chain, now only 10 remain. The region is one where sinking of the land has been marked within historic times. Readers who do not know Wangeroog by name may interest themselves in locating the place with these clues and others in the paragraphs that follow.

When we applied to the German Railways Bureau in Paris for information in regard to German bathing resorts we said that we planned to go to such a place at the end of July. We also specified that it should be a sunny spot, warm, small and characteristically German: that is, one not ordinarily visited by foreigners. The agent suggested Wangeroog. We asked the proprietor of the hotel at Wangeroog: "Are there any other Americans on the island?" He said: "No, but some Americans were here several years ago." However, it so happened that before we left another American family appeared.

The trip from the mainland to Wangeroog is made on a small steamer, and over wide shallows known as the Wadden or Waddensee. A strong wind blows quite regularly across the Wadden. The voyage, accordingly, is one calculated to make poor sailors very uncomfortable. Landing is effected at the southwest corner of the island. During the last part of the voyage, for several miles out from shore, two sailors, one on each side near the bow of the ship

continually make soundings with long poles. From the landing place passengers and freight are transported on a little railroad to the village in the dunes on the north side of the island. In front of the dunes is a vast, flat, sandy beach.

The German visitor, once his luggage is in his room, repairs without delay to the municipal beach-office to pay his fee for a Korb (beach basket-chair) and to rent a plot on the beach. An attendant carries the chair to the spot selected. Then the German,

Part of the Beach at Wangeroog, Germany. At the moment the vacationists have deserted their chairs and forts for exercise on the wide flats exposed by the ebbing tide. Photo by O. D. von Engeln.

with the enthusiastic aid of his family, his companion or companions, proceeds immediately with the business of digging a Burg (fortress) and walling it about with sand. Great effort is expended to make the Burg as perfect and as impressive as adjoining constructions, or, if possible, to surpass these. Then German flags are flown from the tips of bamboo poles. Now the family or companions are ready to settle down to a program of sun baths and surf bathing. We considered the project of sending to the mainland for American flags for our Burg but decided it would be wiser to refrain, lest the

international situation be made more complicated. The college banners and home town insignia that would be so prominent in a similar decorative display at an American resort have no counterparts at Wangeroog. For the Germans there is evidently only one flag.

Bathing is restricted to the period of the rise of the tide. The sport is chiefly in meeting the onset of the breakers. Each of the rival islands asserts that its beach has the strongest and most invigorating surf. Between tides everyone sun bathes. With the exception of the mountain peoples the whole German population from Vienna to the North Sea is of one mind about the supreme therapeutic value of sun rays. Undress at Wangeroog was conservative. On the *Uberfliessungsgebiet* (flood plain) of the Danube, across the river from Vienna, the spectacle of the sun bathers was quite extraordinary very early in the summer.

At Wangeroog summer daylight is long. So there is ample time for promenades after dinner. On nearly every evening one or the other of the hotels sponsored a dance. Tables are reserved, wine is ordered. Practically no food, no beer, no hard liquors are served. There are prizes for the prettiest girls. These go to the plumpest blondes with straw-colored tresses. There was one exception. The other American family included a very attractive, nineteen year old brunette daughter. Many of the German youths must have experienced twinges of conscience for disloyalty to some blonde on one evening because they voted for the American brunette in such numbers that she got second prize.

European peoples generally are not good mixers as we understand that phrase. At Wangeroog the hotel and beach contacts did not appear to develop acquaintanceship. However, at the parties wine tended to mellow this aloofness. Besides they had a favor called *Liebespfeilen* (love darts). These were arrows with padded points which could be shot with considerable accuracy over a distance of thirty feet or farther by blowing them from a tube like that of a Roman candle. No one was offended at being made a target. It was also permissible to ask a complete stranger for a dance, using the formula: "Will you do me the honor." But at the end of the dance the stranger man is expected to return the lady to her friends, bow, and immediately depart.

Our stay at Wangeroog was in what should have been the warmest, sunniest part of the season. However, there were strong winds and rain nearly every day for two weeks. The Germans did not appear to be too much put out by the weather. Perhaps, indeed, it seemed warm to them. But we came away.

EDITORIAL NOTES AND NEWS

Col. Lawrence Martin has been appointed to the newly created Chair of Geography in the Library of Congress. Dr. Martin is now Chief of the Division of Maps. There are now five such Chairs in the Library. The Chair of Geography has been established by a trust fund provided by the late James Benjamin Wilbur. Dr. Martin will be free to serve as an aide in research, first in developing the Library's collection of geographical materials and second, in assisting any individual in the use of the research facilities of the Library.

The National Council of Geography Teachers will hold two summer sessions in conjunction with the National Education Association in Chicago, July 4 and 6. These meetings are in charge of Miss Erna Grassmuck who is now preparing details of the program.

According to a recent release from the U. S. Department of Agriculture, the 1931-32 season of cottonseed meal production was more than two million tons. Of this, a half million tons were used for fertilizer, a quarter-million tons were exported, and most of the remainder was consumed as feed, leaving a very small carry-over for the next season.

A survey in one of the best southern Indiana counties recently made by the state in cooperation with the Federal Government showed that approximately 30 per cent of the total area had been abandoned because of soil erosion. In some cases, the removal of soil and subsoil extended down to bedrock.

Geography and The World Crisis was the keynote of the program given at the geography section of the Educational Conference held April 7 at Ohio State University, Columbus. Addresses were given by Professors Arthur H. Moehlman, Amy Bronsky, and Walter L. Dorn, all of Ohio State University.

Those interested in a new report emphasizing the deterioration of an area from overgrazing may get the one for western Colorado recently issued by the U. S. Geological Survey. Much of this land has been ceded to Ute Indians to whom the return of $1.25 to the acre is due when the Federal Government disposes of the land. Unless some legislation is enacted to conserve this land, the depreciation in value may become so great that it may be impossible to dispose of the land even at the lowest figure.

More than twenty-four million motor vehicles were registered in the United States in 1932. This represents a decline of 6.6 per cent from the preceding year, Washington being the only state showing an increase. The gross receipts from registrations and permits was about 324 million dollars. The states with more than a million registrations are in the order of their rank, New York, California, Pennsylvania, Ohio, Illinois, Texas, and Michigan.

GEOGRAPHICAL PUBLICATIONS

Proceedings of Land Use Symposium. Syracuse University, New York State College of Forestry, Syracuse, New York (1933), fifty cents.

The interest in Land Utilization appears to be steadily increasing. Michigan and New York are engaged in large scale schemes for directed use and reforestation, and the recent program of governmental reorganization proposed by President Hoover provided for a new Under-Secretary in the Department of Agriculture to deal with Land Utilization.

The most recent conference on the subject was the Land Use Symposium held at Syracuse University in connection with the 1932 Summer Meeting of the American Association for the Advancement of Science at which contributions were made by representatives of business, economics, forestry, agriculture, and geography. Among the more important topics considered were the activities of the various National Land Use Committees, the relation of Land Use and Agriculture, Land Use and Forestry, Erosion and Land Use, Land Use and Transportation and Planned Land Use. The published proceedings present an authoritative and comprehensive survey of the way in which land utilization should be adjusted to environmental possibilities and economic demand.

GEORGE B. CRESSEY

Syracuse University

J. Russell Smith. **American Lands and Peoples.** 394 pp. Illustrated. John C. Winston Co., Philadelphia. 1932. $1.44

This volume follows two introductory books, "Home Folks" and "World Folks." The plan of this new series is "Single Cycle-plus." "American Lands and Peoples" covers the Western Hemisphere, and the island possessions of the United States. The major portion of the book is devoted to North America, while South America is treated in the last sixty pages.

The approach is varied and interesting. The journey method and the historical approach are most commonly used in introducing new areas. The continental sections are, in each case, introduced thru realistic reconnaissance trips, in part by plane. The textual material, maps, and pictures unite in developing concrete landscape imagery upon which the child should base definite relationship understandings. There are a few points one might view critically. Latitude and longitude are taught together, the inference being that they are equally significant to the geographer. The Torrid, Temperate, and Frigid Zone terminology is used. Some statements are rather inadequate as this one, "You can ride from Chicago for a hundred miles in several directions and never see a hill as high as a two-story house." The suggestion is that all the area about Chicago is of very low relief, yet the Valparaiso Morainic System rings the city on the west and southwest, giving very rough topography of relatively high relief.

A generous supply of exercise material is provided at the end of each section. The figures are numbered by pages and letters, an excellent device which makes simple the locating of maps and photographs referred to in the textual material. Provision is made for the development of a geographic terminology, while there is a well placed emphasis upon urban geography. In the hands of teachers soundly trained in geography, aware of the special techniques and their use in the presentation of geographic content, the book should prove a valuable addition in the single cycle field.

L. H. HALVERSON

Northern State Teachers College,
Marquette, Michigan

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Mr. Selke is Professor of Geography, State Teachers College, Dickinson, North Dakota. He spent the year 1931-32 in graduate study in geography at the University of Heidelberg and the School of Economics, Mannheim, Germany. This is the twenty-eighth article in our HUMAN GEOGRAPHY SERIES.

Some Opinions Relative to the Content and Grouping of Geography. By William J. Berry 236

Mr. Berry is head of the Department of Geography, State Teachers College, Kalamazoo, Michigan. The collection of judgments which he presents in this article will be a distinct contribution to others confronted by the perplexing problem of subject grouping.

Diagrammatic Map Making. By Helen M. White 242

Miss White is a teacher in the Roosevelt High School, Washington, D.C. The simplified type of map sketching which she describes and illustrates as an aid in teaching will be found highly suggestive. This is the twenty-fifth article in our HOW TO TEACH IT series.

Some Questions Teachers Ask Concerning Map Study in the Intermediate Grades. By Jessie L. Duboc 245

Miss Duboc is Assistant Professor of Education and Supervisor of Teacher Training for grades four to eight, State Normal College, Dillon, Montana. She is author of numerous articles in *Normal Instructor and Primary Plans, Normal College Index*, and of What Should a Geography Textbook Contain, JOURNAL OF GEOGRAPHY, October, 1929.

Man and Water Supply. By Robert M. Brown 250

Mr. Brown is Professor of Geography, Rhode Island College of Education; an Associate Editor of the JOURNAL, and Past President of the National Council.

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